

**UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: Darren KIM, *et al.*

Serial No.: 09/894,568

Continuation of: 09/145,817

Filed: June 27, 2001

Priority Date: Sept. 2, 1998

For: *Notebook Computer  
With Detachable  
Infrared Multi-Mode  
Input Device*

Art Unit: 2675

Examiner: Alecia D. NELSON

Attorney Dkt.: 6487-60420 (25916-228)

**CERTIFICATE OF  
MAILING/TRANSMISSION  
(37 C.F.R. § 1.8A)**

I hereby certify that this correspondence is, on the date shown below, being:

(X) deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450.

( ) transmitted by facsimile to the Patent and Trademark Office.

4/16/04  
Date

  
Jordan Wilson

**RECEIVED**

APR 14 2004

Technology Center 2600

**DECLARATION OF ASHOK VASUDEO UNDER 37 C.F.R. §1.131**

1. I, ASHOK VASUDEO, residing in San Jose, California, am one of the inventors of the invention of "*Notebook Computer With Detachable Infrared Multi-Mode Input Device*" which was filed on June 27, 2001, as U.S. Pat. App. Ser. No. 09/894,568, ("the '568 application") claiming priority as a continuation of U.S. Pat. App. Ser. No. 09/145,817, filed September 2, 1998, now U.S. Pat. No. 6,424,335.

2. I am currently employed by Fujitsu Computer Systems ("FCS"), a subsidiary of Fujitsu Ltd., assignee of the '568 application. FCS is the successor to Fujitsu PC Corporation ("FPC"), where I was employed at the time the subject matter of the '568 patent was invented.

3. Prior to July 31, 1998, the publication date of Japanese Publication No. 10198512 ("Yasuo"), my co-inventors and I had reduced to practice the invention claimed in the '568 patent application within the United States. At the time of our invention, FPC was located in Milpitas, California, and the reduction to practice of the invention described in this declaration occurred at that location.

4. Attached hereto as "Exhibit A" is a true copy of excerpts from one of the original

Invention Disclosures which formed the basis for the '568 application and its parent. The dates on Exhibit A have been removed, but all of the dates are prior to July 31, 1998. A page number has been added to the lower left corner of each page of the document for convenience.

5. I am told that the Yasuo patent has been applied by the patent examiner to reject certain claims of the '568 patent application because: "Yasuo teaches a housing having a top and a bottom a mouse (10) mounted to the bottom of the housing and a touch pad (20) mounted to the top of the housing being used for pointing function."

6. Prior to July 31, 1998, my coinventors and I had reduced to practice a detachable pointing device for use with a laptop computer that had a mouse ball on one side thereof and a touchpad on the other side thereof. This aspect of the invention is discussed at various places in Exhibit A, for example at pages 4, 5 and 6, and is shown in the figures on pages 7, 8 and 9. This aspect of the invention, as disclosed in Exhibit A, is at least commensurate with the disclosure of Yasuo, as applied by the patent examiner.

7. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

7/21, 2004



Ashok Vasudeo

in FPC

24 APR 5  
23-4-95

Company Record No.

INVENTION DISCLOSURE RECORD

Invention :

DETACHABLE MOUSE

Author(s)

DATAREN

KIM

TAKEHI

HAMANO

3. Invention History

(a) When was the invention first conceived?

CONCEIVED IN WRITTEN DOWN IN

(b) When was the model of the first built, tested or demonstrated?

PHOTO TYPE TESTED  
FAB PHOTO TYPE IN

(c) Has the invention been

i) already publicly disclosed or to be publicly disclosed in near future ?  
 Yes When? \_\_\_\_\_

By whom? \_\_\_\_\_  
 No \_\_\_\_\_

ii) already placed in commercial use or to be publicly disclosed in near future ?  
 Yes When? \_\_\_\_\_

By whom? \_\_\_\_\_  
 No \_\_\_\_\_

iii) already offered for sale or to be publicly disclosed in near future ?  
 Yes When? \_\_\_\_\_

By whom? \_\_\_\_\_  
 No \_\_\_\_\_

iv) already described in printed publication or to be publicly disclosed in near future ?  
 Yes When? \_\_\_\_\_

By whom? \_\_\_\_\_  
 No \_\_\_\_\_

①

4. Invention Description

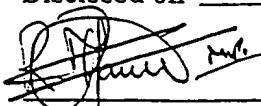
Please prepare and attach the Invention Description as to the following matters.

- (1) Background of the Invention (Field of the Invention, most relevant prior art, problem of the prior art, reference of the prior art, if possible)
- (2) Description of the Invention (detailed or brief explanation of the invention, referenced to sketch of the invention, difference over the prior art, reason why the invention resolved the prior art problem. If necessary, use another sheet)
- (3) Advantage of the Invention (List and Explain)
- (4) Claims (Try, if possible)

5. Invention assessment

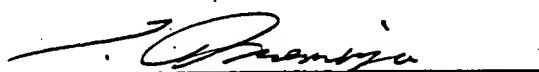
Please assess the merit of the invention in accordance with "INVENTION ASSESSMENT SHEET".

Disclosed on \_\_\_\_\_ by \_\_\_\_\_



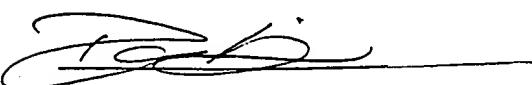
Signature of Inventor

Date



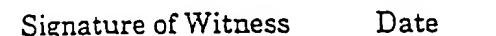
Signature of Witness

Date



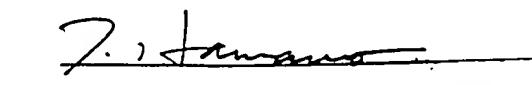
Signature of Inventor

Date



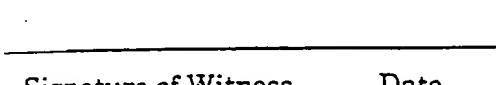
Signature of Witness

Date



Signature of Inventor

Date



Signature of Witness

Date

Signature of Inventor Date

Signature of Witness Date

(You must sign as an inventor and have two witnesses sign, who are not co-inventors, have read the disclosure and generally understood the invention.)

## Invention Description

### 1. Background

Personal computers and notebook computer has made increasing use of pointing devices, such as trackball, glide point, and other devices to increase the usability of the computer. As graphical user interface increasingly becomes the common PC environment, the need for pointing devices have become a necessity for ease of use. Of all the pointing devices available, the mouse has proven as the most efficient device for the PC environment. Typically, the mouse is a separate device that is used at the side of the computer on a flat surface.

The mouse allows the user to simultaneously employ both finger and wrist action to 'click' and 'drag'. The physical movement of the device results in cursor movement on the computer screen that is proportional to the user's physical action. The user can also lift the mouse off the planar surface and reposition it without losing the cursor position on the screen.

Notebook computers have been one the most rapidly growing segment of the PC market. This market includes laptops, palmtops, and notebooks. Notebook computers have traditionally built with interface devices such as trackball, touchpad, ergo track, and stylus devices built into the chassis. The notebook's portability allows use outside of the traditional office environment in any impromptu setting including airports, hotels, person's lap, etc. These built-in pointing satisfy the need for pointing devices in PC use but are often limited due to their fixed position, fragility, or usability. So far, these alternative pointing devices are not as flexible and useful compared to the mouse pointing device. Therefore, many users carry and use an external mouse that can be attached to the notebook through the PS/2 or RS-232 port in the computer. The use of external mouse is convenient while in use but necessitates additional equipment that a user need to carry when traveling with the notebook. In addition, the external mouse utilizes electrical wire cord for signal transmission to the PC notebook. The electrical cord is a nuisance because it can easily become entwined and tangled when not in use.

Recently, introduction of Microsoft scroll mouse is an example of a mouse that offer additional interface function beyond one device. While the mouse does a good job for most interface application, there are still limitations to its use due to its single mode of use. In notebook utilization, the user is often in cramped spaces where there may not be enough planar surface for using the mouse. In addition, the user may want to hold a device in their hands where the mouse will not be useful. The Microsoft scroll mouse is not aiming at solving this type of need in mouse utilization and the design is such that it is intended for desktop usage, not for mobile application.

Another application that is quite common for laptop users is the ability to use in giving presentation. Currently the user will have to have someone click through the presentation slides for reasons of convenience because the presenter may not be able to be physically close to the laptop to perform this function on their own. They may opt to use special remote device that will allow the user to click through the slides on his own but then the user will need to carry this extra device with them.

Accordingly, what is needed is a mouse pointing device that is integrated into the PC notebook chassis for mobility yet can be detached from the main unit to function as traditional mouse pointing device. The disadvantage of the electrical cord needs to be eliminated by alternative means of signal transmission. In addition, for increased functionality for all modes of notebook use or just physical space constraint, a mouse device that offer can additional pointing device mode is needed.

### 2. Summary of the Invention

The primary purpose of the invention is to address the deficiencies of current interface devices in PC notebook described above. The invention offers mouse pointing device capability but overcomes

many of the deficiencies of external mouse device and problems associated with electrical cord management. The device also offer mouse function as well as small touch pad that offer additional modes for pointing or scrolling use.

The invention provides a small mouse pointing device that is integrated into the notebook chassis. The notebook chassis contains a housing cavity about the size of the mouse footprint and offer a locking mechanism that holds the mouse in place when not in use. The external surface of the mouse is molded to fit into the overall industrial design of the notebook seamlessly so that the notebook with the mouse will be a complete unit visually. The mouse communicates to the notebook by electrical signal transmission (via metal conduit, infrared, radio frequency(RF), ultrasound, etc.). The transmitter is housed in the mouse and the receiver and receiver circuitry integrated into the notebook chassis for the best possible coverage. To allow the largest degree of coverage multiple receivers may be used so that to the user can use the mouse without the need to think about which receiver is receiving the signals. The signal transmission for D-Mouse is done through infrared.

The detachable mouse also houses a touch pad that can be used instead of the mouse mechanism. The touch pad offers multiple functions including click and drag as well as page scrolling. The mouse's small form factor allow the user to hold the touch pad in their hand when a suitable planar surface is not available or the user simply prefers to hold the unit in their hands. The device has the ability to differentiate between the mouse use and the slide point use depending on the interface that the user is using. The device will power down when it is not in use so that it can conserve power for longer battery life. In addition, the small form factor coupled with the ability to increase the effective wireless communication range so that the device is used as a remote for clicking through a presentation or other applications.

Another iteration of the device is the mouse plus a track-ball so that the user can use either the trackball or the mouse for pointing device. Both pointing modes will utilize the same ball for cursor manipulation. When using the mouse, the housing will move up and down according to the mouse usage to provide the same 'mouse' action as traditional mouse. The ball will be made of sufficiently high friction material for use as mouse.

See drawings for description of detachable mouse concept.

### 3. Advantage of the Invention

Notebook chassis that contains cavity to hold the detachable mouse.

Small form factor designed to balance utility, weight and mobile applications

Dual pointing device integrated into one pointing device.

Wireless communication supported through infrared or radio frequency to eliminate electrical cord management problems.

Mouse integrated into the main unit visually.

Receiver diode and logic circuitry housed in notebook chassis.

Use of multiple receiver for increased coverage.

Largest angle of vision for the transmitter and receiver.

Eliminates the need for external mouse when traveling.

Wireless communication frees the PS/2 or RS-232 connector port for other devices.

Touch pad provides click and drag function as well as scrolling function for viewing documents or looking through Internet pages.

Small mouse mechanism for compact design.

The dual pointing device allow the use of the mouse as a remote to click through presentations.

#### 4. Claims

A small mouse pointing device that is integrated into the notebook chassis. The notebook chassis contains a housing cavity the size of the mouse footprint and offer a locking mechanism that holds the mouse in place when not in use.

The external surface of the mouse is molded to fit into the overall industrial design of the notebook seamlessly so that the notebook with the mouse will be a complete unit visually.

The communication between the mouse and the notebook is accomplished through active infrared. The infrared transmitter is housed in the mouse and the receiver and receiver circuitry integrated into the notebook chassis. The infrared receiver is housed in a spring loaded mechanism that pops up as the notebook is opened. The receiver mechanism allows the user to able to rotate the receiver for increased field of coverage depending on the area that the notebook is used.

A chassis containing cavity for docking and locking detachable mouse in place when not in use.

A mouse housing that contains mouse mechanism plus other interface device including touch pad, ergo track, eraserhead, etc.

Use of (1) or more infrared receiver housed in main unit.

Use of (1) or more RF receiver housed in main unit.

A mouse housing that contains mouse like ball mechanism that allow use as mouse mechanism and trackball mechanism

Infrared communication for signal transmission

Wireless design for mouse operation.

Visual integration of the mouse pointing device and the main unit.

Touch pad that contains dual mode of 'click' and 'drag' as well as page scrolling function.

Eliminate the need for external mouse when traveling.

Symmetric mouse housing design for ambidexterious use

Infrared transmitter housed in mouse.

Power saving feature that powers down the mouse when not in use.

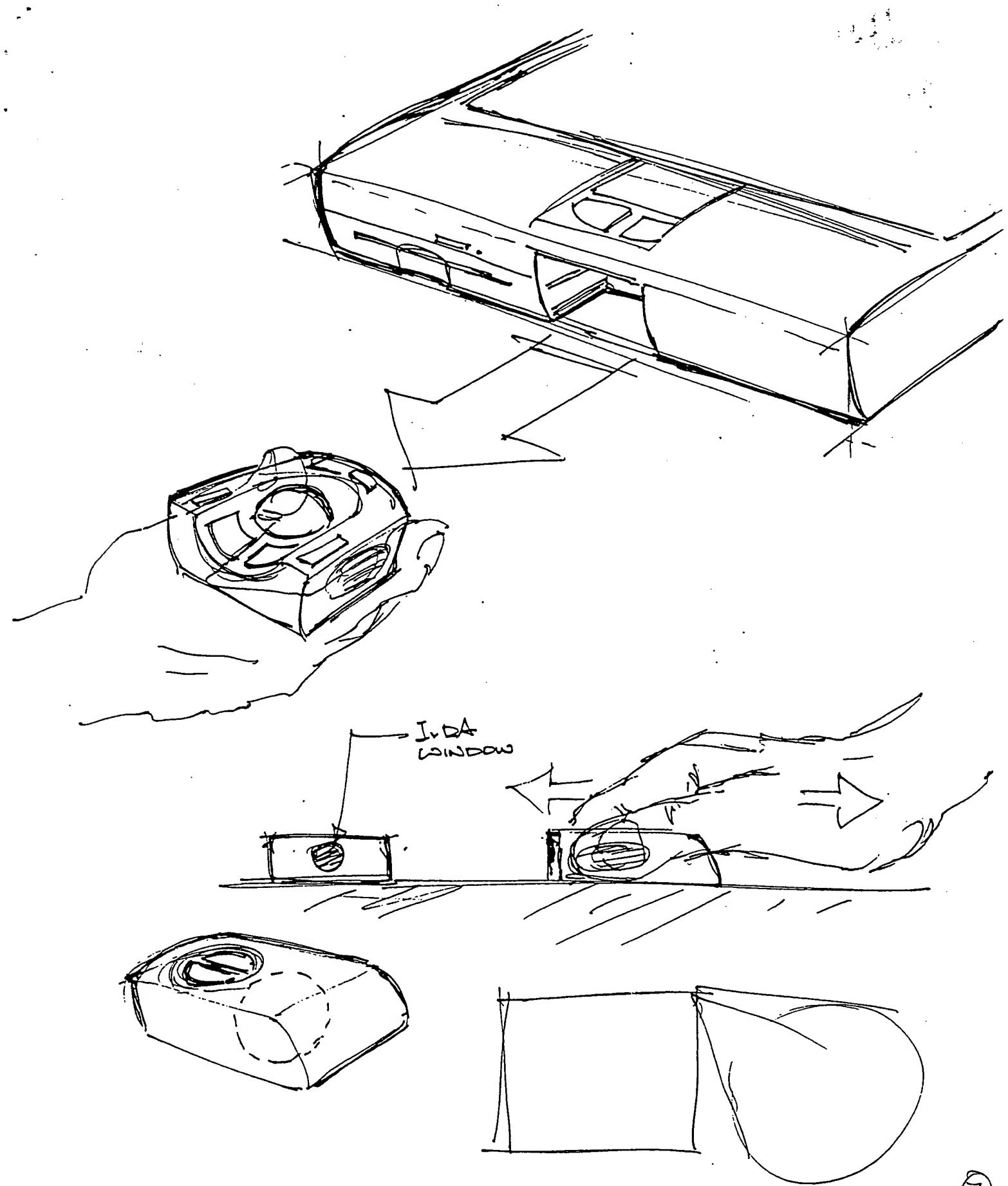
Logic to switch between mouse or touch pad interface depending on interface used.

Switch to toggle between high power (long distance) and low power (short distance mode).

Power on switch on the mouse.

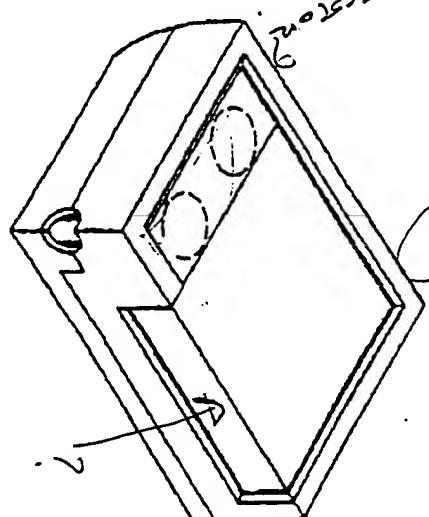
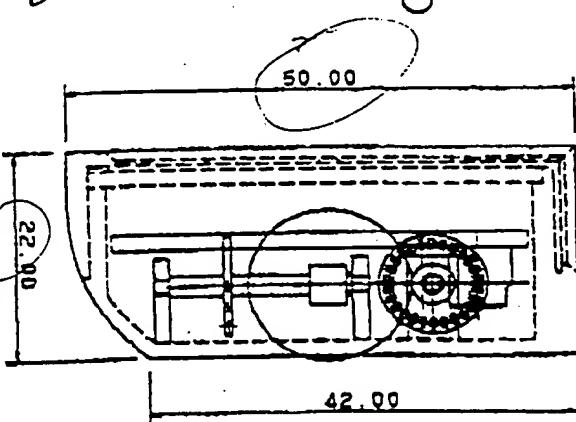
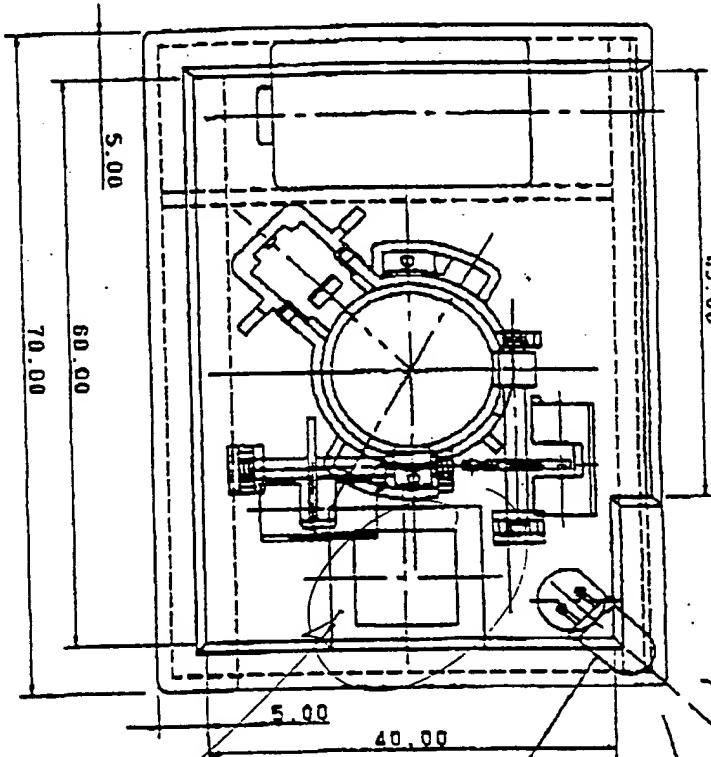
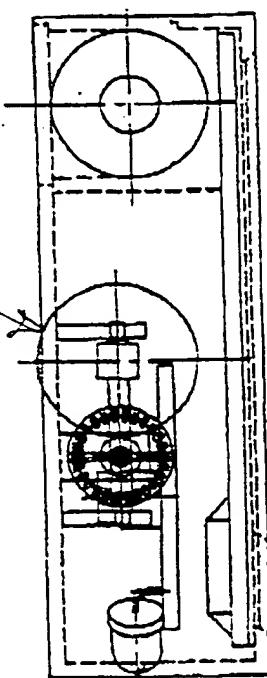
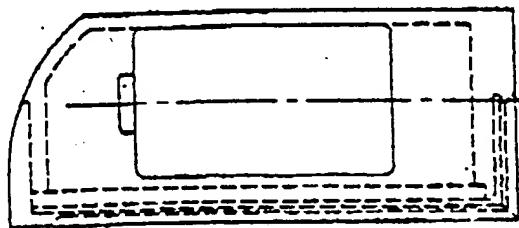
Logic circuit in notebook to handle more than one receiver.

•••-MOUSE'•••



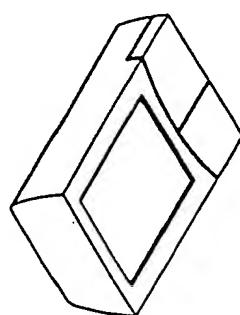
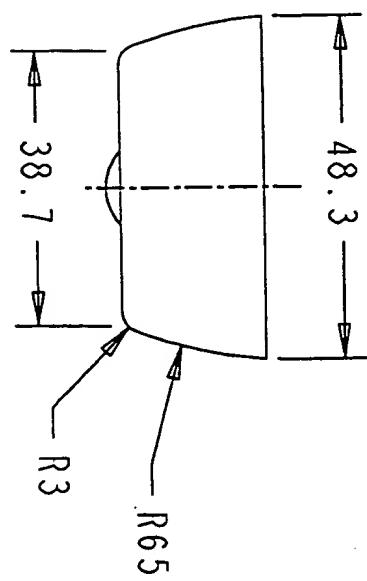
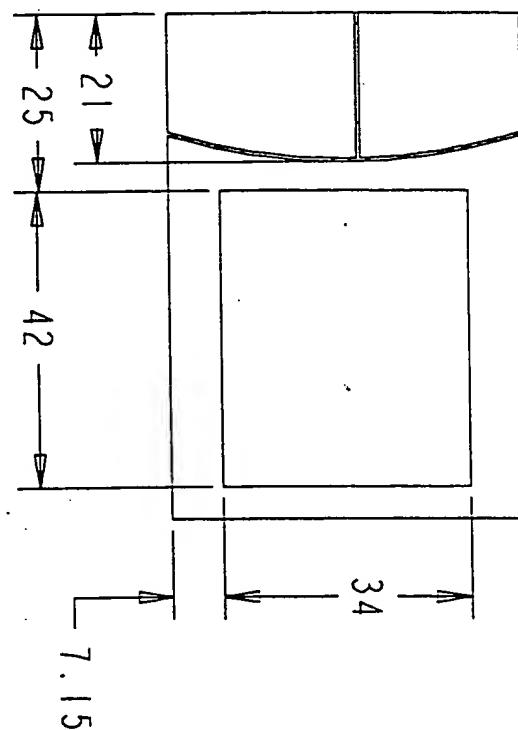
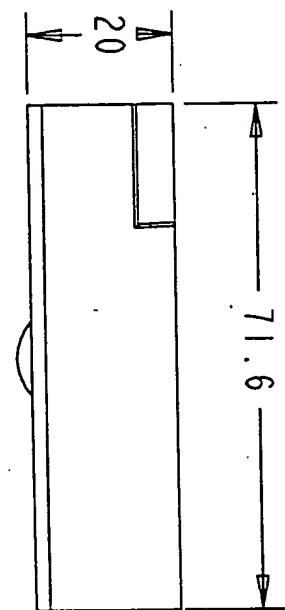
DATE DOCUMENT CONTROL SECTION

ERGOTRACK  
DOME-PT.  
PARK PRESENTATION



ITEM	SIZE	DETAIL	DATE	DESIGNER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER
DATE	DESIGNER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	DATE	DESIGNER	REVIEWER
DESIGNER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	DATE	DESIGNER	REVIEWER	APPROVING ENGINEER
REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	DATE	DESIGNER	REVIEWER
APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER	REVIEWER	APPROVING ENGINEER

(8)



SCALE 0.500

SCALE 1.000

(9)

**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**